migration of birds. Dr. J. G. McPherson gives a popular description in *Good Words* of Mr. John Aitken's fog-counter and the results that have been obtained with it. Finally, Miss Agnes Giberne expatiates upon celestial photography and spectroscopy in the *Monthly Packet.* The article is in continuation of an easily-worded series she is contributing under the title of "Sun-rays and Star-beams."

MARIÉ-DAVY.

DR. G. H. MARIÉ-DAVY, who died at Clamecy on July 16, distinguished himself in various branches of physical science. Astronomy, electricity, general physics, and meteorology, all occupied his attention from time to time, and to all of these branches of knowledge he made important contributions. Born at Clamecy in 1820, Marié-Davy entered the Higher Grade Normal School in 1840. Five years later he was appointed to the Chair of Physics at the Montpellier Faculty of Sciences, and also to the Professorship of Medicine. In 1862 Marié-Davy began his connection with the Paris Observatory. At first he had charge of the terrestrial magnetism service, but in 1863 he became the head of the international meteorological department that he had organised. While occupying this position he published a large number of meteorological memoirs and initiated the periodic distribution of reports and bulletins. He devoted himself chiefly to the study of the atmosphere and its changes, with special reference to the bearing of such matters upon agriculture and hygiene. In 1857 Marié-Davy invented a mercurous sulphate battery which was adopted by the French telegraph authorities, and also by some of the services in other countries. About this time he contributed numerous papers on statical, dynamical, and physiological electricity to various scientific societies and journals. During the revolution of 1870 he left the Paris Observatory and accepted a Professorship at the Polytechnic School—a post that he retained until the return of the Government to Paris. In 1887 he was nominated honorary director of Montsouris Observatory. Marié-Davy was a doctor of medicine and a doctor of physical and mathematical science. Among other honours he was a corresponding member of the Bureau des Longitudes, and an honorary president of the Société d'Hygiene. He was made a Chevalier of the Legion of Honour in 1877, and possessed the Brazilian Order of the Rose, as well as a number of other orders and dignities. The many and varied researches carried on by him, alone and in collaboration with other workers, testify to his greatness. He had a keen sense of right, and dared to give his opinion even when his material welfare was likely to be injuriously affected by so doing. A life so rich in results and void of dissimulation is one well worthy of being imitated.

NOTES.

M. PASTEUR has been elected an honorary member of the Vienna Academy of Sciences.

ON August 4, at about 6.45 in the evening, a distinct earthquake tremor was felt in Leicester and the neighbourhood. The wave passed from about south-west to north-east, and produced the maximum effect in Charnwood Forest. It is reported that the shaking lasted for about five seconds, during which a loud rumbling noise was heard.

A REUTER'S telegram from Vienna reports that a disastrous cloudburst occurred in Middle Styria on August 5. A number of houses were wrecked and several persons lost their lives. Two railway bridges were thrown down on the Grazkoeflach Railway. At about half-past ten in the morning of August 8 two shocks of earthquake were felt in the Mur Valley. The tremors travelled from north to south.

A SINGULAR occurrence has recently been reported from Gamlingay, Cambridgeshire. What appeared to be a dense cloud was observed, but to the astonishment of the villagers the cloud suddenly broke up and showered myriads of ants and flies upon them. So numerous were the insects that they almost covered the ground like a carpet.

THE southern counties are suffering from a plague of wasps. Judging from the correspondence in the newspapers, the insect has been unusually abundant, and has done a large amount of damage in certain districts. At Heathfield, Sussex, more than a thousand nests have been destroyed this summer, and the work of destruction is still going on.

A GOLD medal of the value of 1000 Italian lire is offered by the Royal Academy of Science of the Institute of Bologna, to the author of the best memoir describing a new and efficacious system, or a new apparatus, for preventing or extinguishing fires. The memoir may be written in Italian, Latin, or French, and must be sent in before May 7, 1894.

THE Report of the Postal and Telegraph Conference held in Brisbane in March last has just reached us. At one of the meetings Sir Charles Todd strongly urged the desirability of adopting a uniform method of reckoning time, and after a short discussion the following resolution was passed:—"That it is desirable in the public interests that the hour zone system should be adopted in a modified form, so that there should be one time throughout Australia, viz. that of the 135th meridian or nine hours east of Greenwich."

MR. EDWIN E. HOWELL describes in *Science* a meteorite observed to fall on May 26, 1893. The meteorite entered the ground to a depth of about three feet at an angle of 58° with the horizon. It is an aërolite of very pronounced chondritic structure, and has the usual black glazed appearance. The weight of the mass is 22½ pounds, and dimensions 6 × 7 × 9½ inches Mr. Howell proposes to give it the name of Beaver Creek, from the stream by the banks of which it fell.

THE *Reale Accademia dei Lincei* has issued a circular in which is given a list of the published papers of the late Prof. E. Betti. In honour of his memory it has been decided to collect and publish the whole of his scientific works, with an account of his life, written by the president of the Academy, Prof. F. Brioschi. In order that the collection may be as complete as possible, the circular asks all who have any unpublished letters of the famous geometrician, or a knowledge of works not included in the list, to communicate with Signore V. Cerruti, R. Accademia dei Lincei, Roma.

THE Society for Promoting Agricultural Science in Vienna will hold an international exhibition between April 20 and June 10, 1894. The exhibition will include specimens of economical food for the people, army supplies, appliances for saving life, means of transport, and sport in all its branches. This exhibition is being promoted by the Archduke Francis Ferdinand. Detailed information on the subject can be obtained from the Consul-General for Austria-Hungary, 11, Queen Victoria Street.

THE Board of Agriculture have been authorised by the Treasury to make arrangements, by way of experiment, for the transmission by telegraph of the weather forecasts, issued each afternoon by the Meteorological Council, to the telegraph offices in the rural districts of two typical counties, for exhibition in the office windows. The experiment will extend over the months of

August and September, should harvest operations continue so long, and Essex and Northumberland are the counties selected for the purpose. The measure of success which the forecasts now obtain is such as to lead the Board to the conclusion that the information thus made available will be of practicable value to agriculturists in making their arrangements for the following day.

SHARP thunderstorms occurred at several places in the south and east of England on Friday and Saturday last, accompanied by heavy rain or hail. In the eastern and northern parts of the kingdom the rainfall has been exceptionally heavy. At York the aggregate amount for the week ended the 5th inst. was 1·6 inch, while at Yarmouth it reached two inches, or nearly the average amount for the month of August.

THE question as to whether the term "perennial spring" is applicable to the climate of Quito, as it is claimed by many explorers of the equatorial city, is discussed by Dr. J. Hann in the *Zeitschrift der Gesellschaft für Erdkunde*. He comes to the conclusion that the term does indeed convey a fair idea of the climatic conditions of the place. Not only does the mean temperature and its range of diurnal variations resemble that of our May, but also the changeable weather, with its afternoon thunderstorms, rains and hailshowers, recalls our spring months. It is possible that the contrast between the cool mornings and evenings may be felt more severely in the capital of Ecuador than with us, on account of the greater power of the vertical rays of the sun, but the variability of the mean temperature is, on the other hand, much smaller than in our latitudes. The influence of the weather upon health is very much the same as that of our springs, attacking, as it does, all the mucous membranes of the unwary traveller. It is a question whether a perennial spring is as much of a blessing as the poets would have us believe. The charm of spring lies in the reawakening of life after the torpor of the winter, and where this contrast is wanting, the greatest part of the charm disappears.

A METEOROLOGICAL Society has recently been established at Zi-ka-Wei, near Shanghai, under the presidency of the Rev. S. Chevalier, S.J., and has issued its first report for the year 1892. A good stock of self-registering barometers has been purchased by the Zi-ka-Wei observatory, and distributed among the members of the Society who were able to make use of them. The report contains a brief account of the principal typhoons of the year 1892, accompanied by a map showing their paths, and also an interesting article upon the fogs along the northern coast of China, based upon the observations made at several stations of the Imperial Maritime Customs during the years 1889-91. The discussion shows that from September to November the coast is remarkably free from fog, but that from March to July fogs are very frequent either at the Shan-tung promontory or near the estuary of the Yang-tse-kiang. They are most frequent in the early morning, by far the greatest number being observed before 9 a.m. The conditions most favourable to their formation occur with a low and still falling barometer.

Science contains an interesting account by Mr. E. H. S. Bailey of the effects of a cyclone that passed near Williamston, Kansas, on June 21. At one point, where the track of the cyclone was about six hundred yards wide, elm and walnut trees two or three feet in diameter were torn up or wrenched off fifteen or twenty feet from the ground. The storm travelled eastward, and the debris was distributed round its centre in the manner that usually characterises cyclonic movements. Barbed wire fencing and telephone wires were lifted into tree-tops about fifty feet north of their original position. Heavy farm wagons were utterly destroyed, and spokes were broken off near the hub and carried to a distance of quite half a mile. But even these are comparatively unimportant items in Mr. Bailey's catalogue of casualties. We learn that gravestones (the size is not stated) were carried three hundred yards, and that chickens were stripped of their feathers and trees of their foliage. The west sides of the trees that stood the storm were much roughened, while the east sides were unchanged, owing doubtless to the fact that clouds of sand and dust accompanied the wind and assisted it in the work of destruction. Just before the storm left the earth's surface its fury was at the highest pitch and the width of its track was least. The length of the track, as shown by the devastation, was about five miles.

WE learn from the Kew *Bulletin* that the fine collection of *Stapelias* made by the late Mr. Thomas Westcombe, of Worcester, has been presented to the Royal Gardens, together with a number of notes, descriptions, and beautifully executed coloured drawings.

THE *Bulletin* of the Royal Gardens, Kew, Nos. 76, 77, contains an elaborate report on the preparation and export of Chinese white wax. The eggs of the *Coccus* which produces the excretions are invariably transported from the district where they are produced to that in which the wax is obtained. The industry appears to be a decaying one.

THE first three parts of vol. iii. of "Indian Museum Notes," published under the authority of the Agricultural department of the Government of India, contains a great mass of information on the causes of the various diseases which affect crops in India, descriptions of noxious insects, &c. It is edited by Mr. E. C. Cotes, Deputy Superintendent of the Indian Museum, who himself contributes a large number of notes. The third part is entirely occupied by a conspectus of the insects which affect crops in India, 240 in number.

IT would appear from researches made by Fromme and Stagnitta-Balistreri that no inconsiderable number of micro-organisms are capable of producing sulphuretted hydrogen. Fromme employed as culture media ordinary nutritive gelatine to which tartrate, acetate, or saccharate of iron had been added, the reaction being exhibited by the varying shades of brown to black produced by the organism's growth. Balistreri (*Archiv f. Hygiene*, vol. xvi.) used broth with and without peptone, and tested for the presence of this gas by the insertion of strips of lead paper. Amongst those organisms which produce sulphuretted hydrogen are the *B. proteus vulgaris*, the typhoid bacillus, *B. coli communis*, bacillus of rabbit septicæmia, the comma bacillus, whilst *B. subtilis*, the anthrax bacillus, *Micrococcus tetragenus*, the diphtheria bacillus yield a negative result. On substituting for beef broth that prepared from veal, horse-flesh, or haddocks, no difference in the behaviour of the organisms investigated was observed. When inoculated into raw eggs, which contain such a large proportion of loosely combined sulphur, the *Proteus vulgaris*, associated with so many processes of decomposition, failed, in spite of abundant growth, to produce any sulphuretted hydrogen. On boiled eggs, however, this microbe produces this gas. These interesting results suggest that the power of evolving sulphuretted hydrogen may be possessed in a latent state by certain bacteria, and that just as particular conditions may stimulate their activity in this direction, other circumstances may act as a deterrent.

THE power of gradually adapting themselves to their surroundings possessed in such a remarkable degree by many micro-organisms, has been studied as regards their susceptibility to various strengths of disinfectants by Kossiakoff, and still more recently by Trambusti (*Lo Sperimentale*, 1892, fasc. i.). Kossiakoff showed that a larger dose of a particular disinfectant was necessary to destroy an organism which had been trained by being subjected to gradually increasing doses of the disinfectant than was required when the organism was submitted to it without any such preparation. Trambusti examined the behaviour of various bacteria in the presence of corrosive sublimate, and found that they exhibited striking differences in their ability to withstand this material. Thus whereas the pneumococcus of Friedländer was trained to survive an addition of 1 : 2000 parts of the sublimate to the culture media, the bacillus of fowl cholera was not able to withstand more than 1 : 30,000. If, however, the pneumococcus were taken straight from a fresh culture without any previous experience of the disinfectant, it succumbed in a solution containing 1 : 15,000 parts. The bacillus of swine plague (Rouget des Porcs) was induced to resist an addition of 1 : 8000 parts, whereas without training 1 : 15,000 parts infallibly destroyed it. As regards the retention of their pathogenic properties amongst those organisms investigated, the bacillus of swine plague was the only instance in which the virulence was diminished during its treatment, an addition of 1 : 20,000 parts of corrosive sublimate rendering it innocuous, although its vitality was not destroyed in the presence of 1 : 8000 parts.

Messrs. E. and L. Mach have done a considerable amount of work in connection with the photography of flying bullets, air jets, and sound waves since their last publication on this subject. Some results gleaned from a series of about 1500 negatives have been recently communicated to the Vienna Academy. Sharp images of Mannlicher rifle bullets were obtained of 3·5 cm. diameter. The disturbing electric contacts in the field were dispensed with, as it was found possible to close the spark circuit mechanically by means of the sound wave produced by the bullet itself. A large number of experiments were conducted with the interference refractometer invented by Ludwig Mach, and constructed in a complete form with the aid of the Academy. After some trials they succeeded in producing homogeneous plane-parallel glass plates large enough to obtain an interference field 8 cm. in diameter. If one part of this field is occupied by a projectile, an air jet, or a sound wave passing one of the interfering pencils, the interference bands, usually rectilinear, appear bent in such a manner as to indicate the change of density of air at any point. For the purpose of instantaneous illumination the electric spark was usually employed, but sometimes, especially in cases where a longer illumination was admissible, as in the photography of air jets, blue monochromatic sunlight was substituted.

A simple instrument for trisecting any given angle, invented by Dr. E. Eckhardt, is described in the *Naturwissenschaftliche Wochenschrift*. A straight rule has a slot running along two-thirds of its length, with a pin capable of moving along it. A bar is attached to this pin, and another bar to a rivet at the inner end of the slot. Both these bars are equal in length to the remaining third of the rule, and their free ends are joined by means of another pin. When it is desired to trisect an angle, the pin moving in the slot is placed at the vertex, and the other pin in one of the sides, a parallel to the other side, being drawn through the point occupied by the pin. A curve is now drawn by means of a pencil attached to the unslotted end of the bar, and the intersection of this curve and the parallel referred to is the point of trisection required. The instrument also gives an easy construction for an angle of 36° and for the performance of the "golden section." It is exhibited at Chicago by "The Prussian Universities."

At a recent meeting of the Société Française de Physique, M. E. Ducretet described a method he had employed for making high resistances without self-induction, and hence suitable for use with a telephone in Kohlrausch's method of measuring resistances. He uses a zigzag formed on platinised glass very like that, composed of fine platinum wire, used by M. Mergier, and finds that a piece of platinised glass 75 mm. by 110 mm., allows of the construction of resistances varying from 25 to 100,000 ohms. The glass plates are fixed in a glass vessel by means of an insulating cover, and this vessel is filled with purified petroleum, which M. Pellat has shown to be a very good insulator. In this manner all effects due to moisture in the air are removed, while it is easy to measure the temperature. A layer of mercury, of variable thickness, at the bottom of the vessel allows of the resistance being adjusted to any desired value.

While engaged on some measurements on the electrical resistance of the human body M. Mergier was led to the construction of a simple instrument which, while being easily manipulated, should be capable of making such a measurement with accuracy. The instrument consists of two coils of insulated wire, fixed with their planes at right angles to each other, and placed within the field of a strong horse-shoe magnet. These two coils are connected in series with the resistances to be compared, and to the terminals of a battery. Under these circumstances, the position of equilibrium of the coils depends only on the ratio of the resistances of the two branches (coil and added resistance), and is independent of the value of the electromotive force of the battery. The current is led into the coils by three metallic points, placed one vertically above the other, and dipping into mercury cups. The coils are suspended by a silk fibre or from a steel point working in an agate cup. For use with alternating currents the magnet is replaced by two fixed coils, which are also connected to the circuits containing the resistances to be compared.

Messrs. Deighton, Bell and Co. have published a second edition of Dr. W. H. Besant's excellent "Treatise on Dynamics."

Messrs. J and A. Churchill have issued a little volume entitled "Homburg-Spa: an Introduction to its Waters and their Use," by Dr. Arnold Schetelig.

We have received a report containing the results of observations made at Magdeburg meteorological observatory during 1891, under the direction of Herr A. W. Grützmacher.

Dr. R. W. Shufeldt, in *The Auk* of July, gives an account of an examination of the trunk skeleton of a hybrid grouse. His observations confirm an opinion expressed some years ago, that of all the North American grouse, the genera *Pediocaetes* and *Tympanuchus* are most nearly related to each other; in fact, so close is the relation, that the species are fertile *inter se.*

Bulletin 42 of the Purdue University Agricultural Experiment Station contains a paper by Mr. J. C. Arthur on the relation of the number of eyes on the seed tuber of the potato to the crop obtained. The experimental data brought forward indicate that the proper way to cut potatoes for planting is to divide them into pieces of suitable size, without regard to the distribution of the eyes. In other words, the number of eyes per piece is immaterial, so that the weight or size of the piece should be the all-important factor in preparing seed material.

The annual report of the Royal Botanic Garden, Calcutta, of which Lieut.-Col. G. King, F.R.S., is superintendent, has been issued. From it we learn that all the efforts to introduce the cultivation of the Japanese paper mulberry have failed. As the superintendent points out, this mulberry yields a beautiful fibre, which is naturally so white that it requires very little bleaching, hence it seems a pity that no wealthy landowner has taken up its cultivation on a large scale.

The administration report of the Central Museum for 1892–93 has been prepared by Dr. H. Warth, officiating superintendent, and recently issued by the Government of Madras. It includes an account of corundum deposits in the Madras Presidency, and one on the phosphatic nodules of the Trichinopoly district. Dr. Warth says that the entire area covered by these nodules is about ten square miles, and that about four thousand tons of nodules are lying more or less loosely on the surface.

THE fourth volume of the Bulletin of the American Museum of Natural History contains a large number of important papers, among which we note one by Prof. H. F. Osborn and Mr. J. L. Wortman on "Fossil Mammals of the Wahsatch and Wind River Beds," and another by Mr. J. A. Allen on "The Geographical Distribution of North American Mammals." Mr. F. M. Chapman contributes an article on birds and mammals observed near Trinidad, Cuba, with some remarks upon the origin of West Indian bird life, and Mr. W. Beutenmüller gives several papers on Lepidoptera.

THE proceedings of the Bristol Naturalists Society for 1892 contains several interesting papers. Among others of general scientific interest we note a paper describing the fish-remains of the lower carboniferous rocks of the Bristol district, by Mr. A. J. Heath and Prof. C. Lloyd Morgan. Mr. Claud Druit gives an account of the Green Woodpecker, and Mr. H. J. Charbonnier contributes some notes on the habits of the larvæ of Gracillaria Syringella. Dr. J. A. Norton writes on the coloration of cuckoo's eggs. We regret to learn from the report that this once flourishing society is declining in numbers.

MESSRS. NEWTON AND CO., Fleet Street, have brought out a new kind of gyroscope top, which should be of interest to students of the dynamics of rotation. In it a shallow bell with heavy rim takes the place of the usual disc. At the inner apex is a point which rests on a steel cup in the top of a firm upright. By means of this support, freedom of motion in different planes is obtained without the use of gimbals. The top can be set spinning by twirling it between the fingers, and, owing to the fine workmanship, it will keep in motion for a considerable time. If any geometrical figure made by bending a piece of stout wire is fixed above the point of support, the upper end of the axis of the top follows the form so long as rotation is obtained, running continuously round it in a very remarkable manner. If the top were intended for a gyroscope, its axis should always remain parallel to itself unless guided in the way described. But this is not the case. The axis slowly gyrates and wobbles as it does so. These motions certainly imitate precession and nutation, but the mode of exemplification may lead beginners to a misconception. There is a possibility of being led away with the idea that the earth's axis changes its direction by itself, whereas it cannot be too strongly insisted upon that the effect is produced by external attraction.

AN important communication upon the production of ozone at high temperatures is contributed by Dr. Brunck, of Freiberg to the current number of the *Berichte*. The very title of the memoir is contrary to all our usually accepted ideas concerning the stability of ozone, but Dr. Brunck advances experimental evidence to show that polymeric oxygen is capable of formation and of subsequent existence for a short time even at temperatures of considerable elevation. It is quite true, as Andrews and Tait long ago pointed out, that at 300° ozone is converted into ordinary oxygen, indeed, Prof. Andrews gave 237° as the temperature of dissociation; but Dr. Brunck shows that the change is by no means instantaneous, and that if the gas is only allowed to remain for a short period of time in the heated vessel, a considerable proportion escapes decomposition. A quantity of oxygen was partially ozonised in the ordinary manner by means of a Siemens tube, and the gases, which contained about five per cent. of ozone, were led very slowly through a combustion tube heated to 350° in an air bath; the issuing gas was found to still contain twenty per cent. of the original quantity of ozone present. Filling the combustion tube with fragments of porcelain did not appear to materially diminish the quantity of ozone escaping dissociation. Dr. Brunck then proceeds to describe several high temperature reactions in which oxygen is liberated to a not inconsiderable extent in the condensed form of ozone. Schönbein some years ago made the remark that the oxygen evolved upon heating certain metallic oxides and peroxides appeared to contain ozone, inasmuch as it rapidly liberated iodine from potassium iodide. This statement, which appears to have been overlooked or mistrusted, is completely confirmed by Dr. Brunck, who shows that oxide of silver evolves as much as five per cent. of its oxygen in the form of ozone.

THE most interesting portion of Dr. Brunck's paper, however, is that in which he adduces experimental evidence that the strongly odourous gas hitherto considered to be chlorine, which is usually admixed to a slight extent with the oxygen prepared by heating a mixture of potassium chlorate and manganese dioxide, is in reality ozone. It is certainly singular that Marignac, on attempting to determine the amount of such admixed so-called chlorine in a strongly odourous specimen of the gas, only obtained three milligrams of silver chloride from fifty grams of potassium chlorate. Dr. Brunck now shows that an aqueous extract of the residue in the flask, after heating the mixture of potassium chlorate and manganese dioxide, always reacts neutral to litmus; whereas if free chlorine were evolved the residue must of necessity be alkaline. Moreover, even after repeated washing of the gas with concentrated solutions of caustic potash, sufficient to remove any free chlorine, the gas still maintains its strong odour, at once forms blue iodide of starch with a starch and potassium iodide paper, and bleaches a moistened litmus paper. Further, upon leading the gas through alcohol, aldehyde is produced, an oxidation which free oxygen alone is incapable of bringing about. The active properties and the odour are, however, completely lost after passage of the gas over a layer of manganese dioxide at the ordinary temperature, as would be the case if ozone were the energetic gas present in the oxygen. The above experiments concerning the comparative stability of ozone for a short time at high temperatures quite account for the formation of ozone when a mixture of potassium chlorate and manganese dioxide is heated. Dr. Brunck finally shows that the amount of ozone produced is considerably augmented by removing the escaping gases more rapidly from the heated mixture by means of a current of air or other inert gas. Pure potassium chlorate appears to yield no ozone upon heating, but a mere trace of impurity, such as potassium chloride or silica, causes more or less of the oxygen to be evolved in the form of ozone. Hence commercial chlorate always yields a small proportion of ozone.

NOTES from the Marine Biological Station, Plymouth.—The floating fauna has now begun to assume its distinctive autumn characters. During the past week there were taken, in addition to the larvæ of *Chætopterus*, *Amphioxus* larvæ, the *Tornaria* larva of *Balanoglossus*, numbers of *Plutei* and some *Bipinnariæ*, larvæ of the Polychæta *Magelona* (very young), *Pectinaria*, and *Polydora*, together with scores of *Pilidium*. Medusæ were very plentiful, especially the Leptomedusæ *Laodice cruciata*, *Obeliæ*, and an unidentified *Irene*-like Phialia, and, among Anthomedusæ, a small Margelid. There were also taken two specimens of a species of *Geryonia*, and several of the amethyst tentacled *Amphinenia Titania* (= *Saphenia dinema* of Forbes). *Noctiluca* has reappeared in small numbers. *Evadne Nordmanni* is extremely plentiful; *Podon* on the other hand is relatively scarce. The following animals are now breeding:—The Cladoceran *Evadne Nordmanni* (most carrying embryoes, some provided with the "winter egg"), and a few Lobsters (*Homarus vulgaris*).

THE additions to the Zoological Society's Gardens during the past week include a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, presented by the Rev. W. Meikleham; a Brown Capuchin (*Cebus fatuellus*) from Guiana, presented by Mr. T. Birks; a Rhesus Monkey (*Macacus rhesus*) from India, presented by Dr. G. Lindsay Johnson, F.Z.S.; a Leadbeater's Cockatoo (*Cacatua leadbeateri*) from Australia, presented by Capt. St. G. Ord; an Imperial Eagle (*Aquila imperialis*), two Great Eagle Owls (*Bubo maximus*) European, presented by Mr. Charles Clifton Dicconson, F.Z.S.; a Common Jay (*Garrulus glandarius*) British, two Alligators (*Alligator mississippiensis*) from the Mississippi, presented by Mr. Walter D. Marks; a Yellow-billed Sheathbill (*Chionis alba*) cap. at sea off Staten Island, presented by Capt. E. England; seventeen Guillemots (*Lomvia troile*), two Puffins (*Fratercula arctica*), twelve Kittawakes (*Rissa tridactyla*) British, presented by Mr. Thomas A. Cotton, F.Z.S.; a Cape Crowned Crane (*Balearica chrysopelargus*) from South Africa, presented by Mr. E. S. Spooner; two Peregrine Falcons (*Falco peregrinus*) from Ireland, presented by Capt. R. A. Ogilby, F.Z.S.; a Larger Hill Mynah *Gracula intermedia*) from Northern India, presented by Dr. Best; two Montagu's Harriers (*Circus cineraceus*) European, presented by Lord Lilford, F.Z.S.; ten Slowworms (*Anguis fragilis*) British, presented by Mr. F. A. Leach; a Black Rat (*Mus rattus*) British, presented by Mr. Arch. E. Scott, F.Z.S.; a Brown Capuchin (*Cebus fatuellus*) from Guiana, a Ring-tailed Lemur (*Lemur catta*) from Madagascar, a Ring-tailed Coati (*Nasua rufa*) from South America, deposited; a Yak (*Poephagus grunniens*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET 1893 (RORDAME-QUÉNISSET).—Herr E. Lamp gives a four-day ephemeris for this comet in *Astronomischen Nachrichten*, No. 3175, as obtained by using the elements he published in a previous number of the same journal:—

12*h*. *Berlin M.T.*

1893.	R.A. (app.) h. m. s.	Decl. (app.) ° ′
August 8	12 9 29	+12 28·8
12	12 12 51	11 7·2
16	12 15 38	9 58·7
20	12 18 2	8 59·8

This comet is now rapidly fading, and at the same time becoming very unfavourably situated on account of its rapid southerly motion.

COMET FINLAY 1893.—The following is the current ephemeris for Finlay's comet:—

12*h*. *Paris M.T.*

1893	R.A. (app.) h. m. s.	Decl. (app.) ° ′ ″
August 10	5 57 30·2	+23 7 14·3
11	6 1 16·4	9 53·9
12	5 0·6	12 12·3
13	8 42·6	14 10·0
14	12 22·5	15 47·6
15	16 0·3	17 5·8
16	19 35·9	18 5·1
17	6 23 9·3	23 18 46·0

TOTAL SOLAR ECLIPSES.—Under this heading Mr. Turner (*Observatory*, No. 204) says a few words about the results of the late eclipse and also the total eclipse that will occur on August 8, 1896. With regard to the former the observers who went out may be thoroughly congratulated on their performance. The photographs that were taken of the corona are, as Mr. Turner informs us, now in the hands of Mr. Wesley, who will make drawings of them, as he has done in the case of previous eclipses. During his recent visit to England Prof. W. H. Pickering compared the photographs he took with those already mentioned, with the result that many most interesting points have been revealed. Prof. Pickering, it may be remembered, employed one of Dr. Common's 20-inch reflectors of 45-inch focus, and, used slow plates, with the result that he "has got more detail in the inner corona than is shown on the English photographs." Referring to the eclipse of 1896 Mr. Turner points out the importance of making preparations a long time beforehand, in order to eliminate the possibility of hasty arrangements at the last moment. In the case of this eclipse it seems not a bit too early to commence, for, owing to the most favourable position of the central line of totality, it is probable that a host of observers, both professional and amateur, will be able to co-operate in the observations.

The central line cuts through Norway in the north, the east coast being the more favourable both for observation and comfort in travelling. Passing across Nova Zembla the line reaches Japan, and thus, as Mr. Turner says, "another delightful trip is open to any one with plenty of leisure."

The details of the eclipse are as follows:—

	At Varanger Fjord. d. h. m. s.	Nova Zembla. d. h. m. s.	Siberia. River Amur. d. h. m. s.	Japan. I. of Yezo. d. h. m. s.
Eclipse begins Aug.	8 16 59 43	8 18 30 1	9 1 16 13	9 1 55 8
Totality ,, ,,	8 17 55 37	8 19 28 59	9 2 27 31	9 3 5 26
Eclipse ends	8 18 55 31	8 20 31 54	9 3 36 54	9 4 13 10
Duration of totality	0 0 1 46	0 0 2 0	0 0 2 46	0 0 2 40
Sun's alt. at totality	15°	22°	46°	43°

THE OBSERVATION OF AURORÆ.—We have previously had occasion to refer to the movement for systematically recording the occurrence of auroræ which has been set on foot by Dr. M. A. Veeder. Public attention has lately been called to the matter by a long article in the *New York Sun* describing the plan of observation and the important results that must follow from its extended adoption. The method of observation is very simple, and requires but little time. Each observer indicates on the blanks supplied for the purpose the presence or absence of the aurora. Whenever the fact has been verified by observation the figures denoting the exact time at which the observation was made are entered in the proper space in the blank. The facts which it is especially desired to learn are the exact times of sudden changes in the brightness of the aurora, the extent of sky which it covers, and its position relative to the true north. In case observations are not made the spaces are simply to be left blank. Each blank sheet prepared in this way covers an entire month, and is arranged so as to enable comparisons to be made at a glance between the records from different stations. Only by the coordination of results uniformly recorded can any definite information be obtained as to the distribution, periodicity, and source of luminosity of auroræ. Dr. Veeder has employed his scheme of observation for some years, and finds that it works satisfactorily. Arrangements have been made for its introduction into the observatories of Archangel, Pawlosk, Ekatrainbourg on the Ural mountains, Irkutsk in Siberia, and at other points. The Director-General of the Italian Meteorological Service has also written expressing approval of the purposes of the research, and promising to aid it in every way possible. American observatories have also taken up the system, and other observations have been provided for on an extensive scale, so interesting and important results may be expected. Those who desire to take part in the work can obtain all information relating to it by application to Dr. Veeder, Lyons, New York.

NEW DETERMINATION OF THE CONSTANT OF UNIVERSAL ATTRACTION.—In a note under this heading on July 27 we gave a list of some of the different values obtained for the density of the earth. The following should be added to make it more complete:—

Jolly and Poynting, by the method of weighing, obtained 5·58 as the value for the mean density.

Wilsing's determinations in 1887 and 1888 gave 5·58 with a very small probable error.

"HIMMEL UND ERDE" FOR AUGUST.—In the current number of this periodical Prof. von Braunmühl contributes the discourse which he delivered before the Mathematical Society at München on "Galileo Galilei." Dr. Wilhelm Meyer continues his series of chapters on the planet Mars, and in this one he is able to reproduce some of the most interesting drawings of Prof. J. M. Schaeberle, made at the Lick Observatory. The discussion deals chiefly with the observations made and the suggestions put forward by such observers as Holden, Schaeberle, Barnard, Pickering, &c. Chapter v., on "The origin of the world